Biology

Lesson 2

Molecular Technology

By mr: khaled hosny

www.cairodar.com

Question one :

Choose the correct answer

1- The hormone that its secretion increases on the arrival of food to stomach is …….

(**gastrin** - cholecystokinin – secretin – all the previous)

2- There is an area that disappeared during sarcomere contraction ……

(I – Z –**H** – A)

3- The liver is affected by hormone …….

(Insulin – Glucagon -Adrenaline – **All the previous**)

4- **Number of ligaments that connect the femur bone with the Fibula is** ……(**1** – 2- 3- 4)

5- If the number of the chromosomes in pea plant cell is 7 pairs ,so the number of chromosomes in the tube nucleus is ……chromosomes.

(7 pairs **- 7** - 21- 14 pairs of chromosomes)

6- The second meiotic division is taken place in ……..

(Griffin follicle – Endometrium – **Fallopian tube** – uterus cavity)

7- If the number of chromosomes in generative nucleus is (X) , so the number of chromosomes in the male nucleus is …..(1/2 X – **X**- 2X – 3X)

8- The hormone that its secretion increases in the pregnant women is ……(Aldosterone – Progesterone **– Estrogen** – Prolactin)

9- The hormone that is called the estradiol hormone is ……..

(FSH – LH – relaxin – **estrogen**)

10- The number of articulating or separated vertebra in the vertebral column is ……(7- 12**- 24**- 33)

كايرو دار
متعة المعرفة

11- The level of para-thormone hormone increases when the level of ……..becomes below normal (Na – K- Ca – Mg)

12-Gametes of plasmodium malaria is formed inside ……

(Anopheles stomach – salivary gland of anopheles – blood of infected person – liver cells of infected person)

13- The period of pregnancy in cattle prolongs …….. Months.

(5 - 9 – 6 – 11)

14- The part that is considered as respiratory system for embryo in uterus is ……(Lung – Chorine – amnion – Placenta)

15- The pelvic girdle is consisted of two identical halves connected to each other through ventral bone called ……

(Ilium – pubis sumphysis – acetabulum cavity – Patella)

16- The mammary gland is stimulated to secrete milk by hormone is secreted from ……..gland .

(Ovary - adrenal gland – Parathyroid gland –Pituitary gland)

17- The dwarfism is resulted due to …….

(Hyper secretion of growth hormones in childhood - Hypo secretion of growth hormones in childhood - Hypo secretion of growth hormones in adult - Hypo secretion of the thyroxin hormone in child hood)

18- **The hormone is responsible for absorption of Na ions from kidneys (** parathormone – Aldosterone – estrogen – antiduretic hormone)

19- Male gamete in ferns plant is …….(ovary – Antheridia – archegonia – anther)

20- All of the following are considered from upper limb except ……

(Fibula – ulna – humerus – wrist)

21- The edible part of the apple is ……..

.(anther – Ovary – Receptacle – carpel)

كايرو دار
متعة المعرفة

22- Walls of ovule will lead to form ……. in the dicotyledonous plant (Micro Pyle - **Testa** – Fruit – Two cotyledons)

23- The breeding cycle starts at 20 th day of September ,it is probably to release ovum from the ovary in …….

(25th September – 30th September – **4th October** – 10th October)

24- Female of honey bee are produced from …….

(**fertilized queen** – unfertilized queen – fertilized worker – unfertilized worker)

25- First anti-codon in the protein synthesis is …….

(AUG – UAA – UAG – **UAC**)

26- The number of nitrogenous bases that entered in the structure mRNA that a protein contains 150 amino acids is …….

(150 - 300 **- 450** – 900)

27- The releasing factor combines with all of the following except ……Codon .(UAA - UGA - **UUU** – UAG)

28- If the codon is triplet the probability of the codons of different amino acids will be ……(3^4 - 3^3 **– 4^3** – 4^4)

29- Restriction enzymes can cleave which of the following sequences …….

GAGA - AGAG **- AAGCTT** – AACG - TTGG

30- A polypeptide is formed of 21 amino acids , the least possible number of nucleotides in its RNA would be (21 - 42 **- 63** -62)

31- Number of translated codons from mRNA ,if you know mRNA is Tran scripted from gene consists of 900 nucleotides is ……

(300 - **299** - 900 - 600)

32- An enzyme that forms peptide bond among amino acids …….

(Hydrolase – **Peptidyl transferase** - reverse transcriptase – None of them

كايرو دار
متعة المعرفة

33- Production of influenza vaccines made up by
(Recombinant DNA – Hybrid DNA – Replication DNA – None of them)

34- From unsuitable condition that has damage effect on plant ……

(Shortage of nutrients – Toxic fumes – untreated sewage – Herbicides)

35- **From the structural immunity in plant that prevents invasion with microbes**…….(cork formation – deposition of gums – Tyloses – all the previous)

36- **Type of white blood cell that converts into large phagocyte cell when the microbes enter** (Basophil – neutrophil – eosinophil – Monocyte)

37- T_H cant identify the type of antigen unless it combines with …….

(CD4 - CD8 - MHC2 - IgM)

38- Faster method in which the antibody attacks microbes ……..

(Neutralization - Lysis -precipitation -Agglutination)

39- The complements can't work unless in presence of ……..

(B - T_H - Ts - Tc)

B- Determine the place and function of:

1- Spores of Vougheir found on lower surface of polypodium helps in production of sperms

2- Amniotic fluid surrounds the baby in uterus protects baby from dryness and shocks

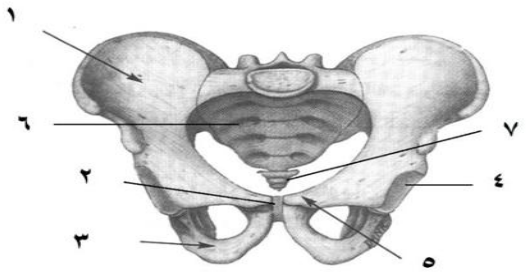
3- Prostate gland at neck of urinary bladder secret alkaline fluid to neutralize the acidity of urethra

4- acrosomes at head of sperm secret hyaluronase enzyme

كايرو دار
متعة المعرفة

c- From the following figure answer the following question :-

1- the following figure illustrate the axial or appendicular or both of them ? WHY?



Both of them as there are vertebrae of sacral and coccygeal and presence of pelvic bone

2-Write All Types of hormone that have an effect on this structure and write their importance ?

Relaxine relaxation of pelvic bone during pregnancy

Calcitonin increase ca level in it

Parathormon hormone decrees the calcium level in bone

Growth hormone produce protein synthesizes

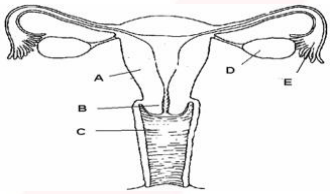
3- Write the number that indicates each of the following :

a- Ventral and anterior bone(5) b- Dorsal bone (1)

c-Ventral and posterior bone (3) d-The projection where head of femur fits in it(4)

c2- From the following figure answer the following question :-

1- This device indicates what ? How this structure adapt its function ?



This device is female reproductive system .

It is fixed with elastic ligament as it facilitates its expansion during pregnancy ,and has fallopian tube that has finger like projection and funnel shape ,thick muscular sac

2- Determine the name and number of letter that indicates

a- Secretes relaxin hormone (ovary)

b- Its damage leads to miscarriage (uterus)

كايرو دار
متعة المعرفة

Question Two:-

Write the scientific name that indicates each of the following statement

1- The hormone its hyper secretion leads to Osteoporosis and bone fragile**(parathormone hormone)**

2-The nervous hormone that is secreted from the pituitary gland and affected on mammary glands in body **(oxytocin hormone)**

3- The connective tissue that connects between gastrocnemius muscle and Ankle bone **(achilles tendon)**

4- It is posterior downwards process carried by the neural canal **(neural spine)**

5- The actual inventory of energy in the muscle **(glycogen)**

6-The gland that secretes a fluid that nourishes the sperm in testis **(sertoli cells)**

7- The zygote that covers with thick coat that protects it from the unsuitable condition **(zygospore)**

8-Tha part that is responsible on formation of apple fruit**(receptacle)**

9- Enzyme is used in the device of PCR to make many copies **(Taq polymerase)**

10- Protein binds to UAA codon of mRNA **(releasing factor)**

11- Gene is present on chromosome (X) and cause bleeding **(Hemophilia)**

12- Gene is present on chromosome number 11 and controls the level of glucose**(insulin)**

13- Living organisms from which reverses enzymes are isolated **(virus)**

14- It is the site at which restriction enzyme can cleave **(recognition site)**

كايرو دار
متعة المعرفة

15- It is sequences of nucleotides that determines the sequences of amino acids in corresponding polypeptide chain contain U **(codes)**

16- DNA from two different sources are mixed together after heating**(hybrid DNA)**

17- stimulation the plant to resist diseases through methods made up by human**(plant breeding)**

18- Small lymphoid cells found on lower surface of mucous lining wall of small intestine **(payer's patches)**

19- Type of white blood cells produced by bone marrow and represents 5 – 10 % of lymphocytes **(B –cells)**

20- Mediate immune response is taken place at place of infection with microbes **inflammation**

21- It is a type of mutation taken place due to environmental factors **(spontaneous)**

22- Type of twins that their body is connected at certain part of body **.(Siamese)**

23- It is ability of unfertilized egg of frog to produce new complete individual by some experiments**(artificial parthenogenesis).**

24- An specialized cells in testis in man helps sperms to fight microbes**(sertoli cells)**

25- Small lymphoid cells found on lower surface of mucous lining wall of small intestine **(Payer's patches)**

26- Type of white blood cells produced by bone marrow and represents 5 – 10 % of lymphocytes**(B cells)**

27- Internal defense system depends on non-specific process and mechanism that surrounds microbes through minutes to prevents spreading **(Inflammation)**

كايرو دار
متعة المعرفة

B- Give reasons for each of the following :

1-Presence of the cholinesterase enzyme at the neuromuscular junction

To destroys

That destroys acetylcholine into acetate and choline converts muscle from polarized into depolarized

2- The function of micro Pyle is different in ovule and seed

In ovule allows double fertilization process where in seed allow passage of water during germination

3- Spirogyra may make conjugation in some cases

During unsuitable conditions such as drought and temperature changing and change purity of water

4- Zygote of spirogyra divides by meiosis during its germination

In order to reduce number of chromosomes from 2n into 1n to form haploid spirogyra filament

5- Individual that is produced by natural parthenogenesis may be (N) or (2N)

As in honey bee to produce haploid drones 1n while in case aphid insect divides by mitosis to produce eggs 2n

6- Source of feeding of sperm is different from the inside and outside testis

Inside testis by sertoli cells while outside by seminal vesicle and prostate gland

7- Regeneration is different in human than Hydra

In human healing of wounds only while in case Hydra if we cut it into longitudinal or transverse pieces each part will produce new hydra

8- Production of large number of sperms in normal males

Most of them are lost during journey ,they share in the production of hyaluronase enzyme to dissolve part of ovum coat

كايرو دار
متعة المعرفة

9- Placenta in adult female acts as endocrine gland

As it is responsible for production of progesterone hormone

10- Human genome plays a role in criminology events

As by knowing DNA of human we can draw complete picture about human body and determine the gene of red blood cell type and finger print

11-Nucleolus plays a role in protein synthesis

As it is center of ribosome production that is responsible for protein production

12- Damage of poly-adenine tail on mRNA leads to stopping protein synthesis

As this leads to damage of mRNA

13- mRNA may be called polysomes or polyribosomes

Where there are more than 100 ribosomal subunits to translate the same mRNA in short period of time

14- Bacteria cant degrade its DNA also it has restriction enzymes

Due to presence of modification enzymes that add methyl group at recognition

Question three

a- Determine which of following statement is correct and which is incorrect and give reasons:

1- Insulin plays role in the metabolism

Yes , as it can control the conversion of glucose into glycogen , and can oxidizes glucose inside mitochondria

2-Relaxation of muscle doesn't need energy

Yes , due to separation between transverse links from actin filaments

كايرو دار
متعة المعرفة

3- Same hormone may have different effects on different tissues

Yes as ADH can hormone can affect on the kidney tubules and blood vessels

4-All joints have synovial fluid

No , as there are fibrous and cartilage joints

5- All hormones are made up of protein

No ,there are some hormones are made up of amino acids and lipids

B-What is the difference between:-

1- Lymphokines and interleukines

Lymphokines produced from T suppressor organize the immune response and cause death of most of lymphocytes

Interlukines produces from T cytotoxic tthat stimulates other lymphocytes on their function

2- Acrosomes and corpus lutein

Acrosome at the head of sperm secertes the hyaluronase enzyme that dissolve part of ovum coat to facilitate fertilization

Corpus founf in female ovary to secrete the progesterone and estrogen

c- Give comment on

1- Masculinization appears on female in some cases

Due to tumor on cortex of adrenal gland and disturbance in sex hormone secretions

2- Ripening of fruit and seeds may lead to stopping the growth and death of plant

AS the stored food is consumed and inhibition of hormones of plant

3- Regeneration isn't considered as reproduction in some cases

As it is restoration in crustache to restore lost parts , while in higher vertebra only

كايرو دار
متعة المعرفة

Question four

B- Choose from column A that suits column B

Hormone	Function
1- ADH	**a-Responsible for protein metabolism**
2- ACTH	**b-Stimulate the corpus formation**
3- GH	**c- Responsible for reabsorption of water**
4- FSH	**d-Stimulate the cortex of adrenal gland**
5- LH	**e-Stimulate the thyroid gland to secrete hormones**
6-TSH	**f- Stimulate the mammary gland to secrete milk during lactation**
	G-Stimulate formation of sperms in testis

1- c 2- d 3-a 4- g 5-b 6- e

B- Compare between each of the following :-

1- Vertebra number (5) and vertebrae number (30)

Vertebra number 5	Vertebra number 30
Found in the cervical region Moderate in size	Found in the coccygeal vertebra Smallest fused

2- Fibrous joint and synovial joint

Fibrous joint	Synovial joint
Located between serrated bones of skull Not allow the movement	Contains synovial fluid most wide spread in human body such as knee and elbow joint provides limited movement Found at Hib and shoulder joint provide wide movement

كايرو دار
متعة المعرفة

3- Graffian follicle and seminal vesicle

graffian follicle	Seminal vesicle
Found in the female ovary Secretes estrogen that increases the vascularity of endometrium thickness and female secondary characters	Found in the male reproductive system Store sperms until gets outside of human body and produce sugary fluid called fructose

4- Progesterone and testosterone

Progesterone	Testosterone
It is secreted from corpus lutein and placenta Keeps the thickness of uterus and increases it	It is secreted from intestinal cells of male Responsible for male secondary characters

C-What consequences on each of the following

1- Hyposecertion of thyroxin hormone in the adult

Leads to myxedema in the adult (dry skin –rapid fatigability – decrease heart beats – loss of hair – decrease the metabolic rate and obesity)

2- Remaining testes into the body of adult male

Leads to infertility and no spermatogenesis

3- Putting the egg of frog into salt agitation

Leads to artificial parthenogenesis and duplication of number of chromosomes

4- Absence of finger like projection of fallopian tube

Has no ability to receive the ovum and so ,no fertilization

كايرو دار
متعة المعرفة